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American Hawthorns. Twenty of the twenty-two natural groups in which the North American species of *Crataegus* can be arranged are now largely represented in the Arboretum collection. Species of the *Aestivales* and the *Brachyacanthae* which contain some of the most distinct and interesting species of the genus are not in the collection. To the *Aestivales* only four species are now referred, inhabitants of the coast region of the south Atlantic and Gulf states with an outlying station in North Carolina. They grow where the ground is wet, usually in deep depressions often filled with water throughout a large part of the year and are slender trees or small or large round-headed shrubs. The flowers which are as large or larger than those of any other Hawthorn, with usually twenty stamens and deep rose-colored or pink anthers, are arranged in usually three-flowered clusters and open before the leaves unfold. These plants are almost universally called "May Haws" in the region where they grow because the scarlet, juicy, sub-acid fruit ripens in spring; it makes excellent jelly, and great quantities of it are used for this purpose. No species of this group has been planted in the Arboretum; they are perhaps worth trying here for *Crataegus* is generally a hardy genus, and it is impossible to predict that any of its species will fail in any locality. The Arboretum will be glad to hear if *Crataegus aestivalis* or its related species have been cultivated successfully in any part of the world. *Crataegus brachyacantha*, the "Pomette Bleue" of the Arcadians of western Louisiana, is a large and handsome tree with lustrous foliage, small flowers in many-flowered crowded clusters, and bright blue fruit about half an inch in diameter. One of the handsomest of the American Hawthorns, it differs from all the species of the genus in the color of the fruit. The extreme southern part of Arkansas, eastern and western Louisiana

and eastern Texas is the home of this tree, which often covers large, often submerged areas, and is sufficiently common, when the trees are covered with flowers, to be a conspicuous feature in the landscape. Seedlings of this tree have been raised several times at the Arboretum but have not proved hardy. The other species of the group *Brachyacanthae*, *Crataegus saligna*, is common on the banks of streams at high altitudes on both slopes of the Continental Divide in Colorado where it is particularly conspicuous in early autumn from the brilliant orange and scarlet colors of the leaves. This plant has been raised several times at the Arboretum but has not yet established itself here. Such failures are probably due to accident for there seems to be no reason why *Crataegus saligna* should not grow as well in the Arboretum as the other Colorado species.

The distribution of the different groups of the American species is interesting. The most widely and generally distributed is the *Crusgalli*, to which the so-called Cockspur Thorns belong. Individuals of this group do not form as large colonies as those of some of the other groups, but they are generally distributed from the valley of the Saint Lawrence River in the Province of Quebec to the shores of the Gulf of Mexico in western Florida and westward to Iowa, eastern Kansas and Oklahoma, and to western Texas. The species are most abundant in southern Missouri, Arkansas and western Louisiana. The *Punctatae*, of which the type is *Crataegus punctata*, one of the largest of the American species, is northeastern but ranges southward on the high Appalachian Mountains to northern Georgia, and to Missouri and Arkansas where it has a number of representatives. Species of the *Virides* grow on the coastal plain of the south Atlantic states and in the coast region of the Gulf States to western Texas; they are most abundant in Texas, western Louisiana, southern Arkansas and in the valley of the Mississippi River as far north as Illinois. East of the Mississippi River individuals of this group are not numerous, but westward, especially in eastern Texas, they cover great tracts of low ground; and the type of the group, *Crataegus viridis*, is under favorable conditions the most gregarious of all the American Hawthorns. This group is well represented in the Arboretum by *C. nitida*, a large tree of the bottom-lands of the Mississippi River in Illinois and one of the handsomest of all Hawthorns. The *Pruinosae* is a northern group but ranges southward on the Appalachian Mountains, and reaches Missouri where it is abundant with numerous species in the southern part of the state and northern Arkansas. The *Tenuifoliae* is a distinctly northeastern group but is largely represented on the Appalachian Mountains as far south as North Carolina, with a single species in southern Arkansas. The *Coccineae* is composed of large trees with large leaves and flowers, and large and showy scarlet fruit; it is entirely northeastern and most abundant in western New York, southern Ontario and northeastern Illinois. The *Dilatatae* is another group with large leaves, flowers and fruits and is confined to the northeastern states, and to Missouri and eastern Kansas. It is well represented in the Arboretum by *Crataegus coccinioides*, now one of the handsomest trees of the collection. The *Rotundifoliae* are entirely northeastern, and one of the species, *C. rotundifolia*, is the most northern in its range of the American Hawthorns. Species of this group are not found south of

Pennsylvania or west in the United States of Indiana. The *Intricatae* with many species is interesting because most of the representatives are small shrubs which until recent years have been entirely overlooked by botanists. This Group is widely distributed from Canada to Texas and is best represented in Pennsylvania and Michigan; it apparently does not occur in the coast region of the south Atlantic and east Gulf States; it has not been noticed in Louisiana and is rare, except in northwestern Arkansas, in the states west of the Mississippi River. Belonging to this Group are many attractive garden plants now growing in the Arboretum. In the *Uniflorae* are only small shrubs with small flowers; nowhere very common they are distributed from eastern New York to Alabama and Texas. Handsome plants are the two shrubs which compose the *Triflorae* and which grow in the hill regions of northwestern Georgia and northern Alabama. The *Pulcherrimae*, *Bracteatae* and *Silvicolae* are small groups confined to the southeastern states, with one species of the *Silvicolae* in eastern Louisiana; these three groups still imperfectly known. The *Microcarpae* with three species are distinguished by their small fruits and by the principal veins of the leaves which extend to the point of the lobes as in other species of *Crataegus* and also to the bottom of the sinuses between the lobes. Two of these species, *C. apiifolia* and *C. spathulata*, are well scattered over the southern states; and the third, *C. cordata*, the so-called Washington Thorn, is a rare and local tree in the region from western North Carolina to southern Missouri and southern Illinois. It is hardy in the Arboretum where it is the last species to flower. An old inhabitant of gardens, it is not surpassed in the beauty of its foliage in autumn or the brilliancy of its fruit which remains on the branches until spring. The great *Flavae* Group is distinctly southeastern with many species which vary in habit from large trees to shrubs, and are well distinguished from the species of other groups by the conspicuous glands on their mostly obovate-cuneate leaves, petioles and corymbs, by their zigzag branches and by the hard dry flesh of their green, orange or red fruit. The plants of this Group are very common in southern Georgia, western Florida, and southern Alabama, with a single species in eastern Louisiana, near the banks of the Mississippi River in West Feliciana Parish, and with several species in the southern Appalachian region up to altitudes of about two thousand feet. This distinct and interesting Group is well represented in the Arboretum by old trees of *Crataegus aprica* from western North Carolina. The *Macracanthae*, better known as the *Tomentosae*, is one of the most important eastern groups, common with many species in Canada and the northern states, but absent from the southeastern states, the coast region of the east Gulf States and Louisiana, and very rare in eastern Texas and Arkansas, but represented in the southern Rocky Mountain region. The fruit of some of the northern trees of this group is perhaps more beautiful than that of the plants of the other groups. Several species of the *Macracanthae* flower and produce fruit in the Arboretum. The *Douglasianae* are black-fruited trees and shrubs of the northwestern and interior parts of the continent, with one species in the Lake Superior region of northern Michigan. All the species of this Group are growing well in the Arboretum, as are those of the *Anomalae* a northeastern Group related to the *Macracanthae* and *Douglasianae* by the pres-

ence of longitudinal cavities on the inner faces of the nutlets of the fruit. The *Molles*, which is most closely related to the *Coccineae*, is mentioned last that attention may be drawn to some of the species which are already in flower. The distribution of this Group is peculiar. It is represented in the valley of the St. Lawrence River in the Province of Quebec, in Maine, eastern Massachusetts and northern Delaware; from western Vermont and Massachusetts and from western Pennsylvania it is common westward to eastern Nebraska and Kansas; it occurs in middle Tennessee, northeastern and eastern Mississippi and in northern Alabama where there is a single species. It is largely represented in Missouri; there are several species in Arkansas where they are most abundant in the valley of the Red River; in eastern Texas several species are widely distributed, abounding in the valley of the lower Brazos River and extending westward to that of the San Antonio. The Group has no representative in Louisiana, only two in Mississippi and one in Alabama; in the rest of the country, so far as is now known, the Group is not represented. The largest trees are found in this group; they have large leaves more or less covered with hairs, especially early in the season, large flowers in many-flowered clusters, and large, scarlet or rarely yellow, usually dry and mealy, often edible fruit. The Group is North American with the exception of *Crataegus peregrina*, a plant raised many years ago at the Arboretum from seeds received from the Botanic Garden at Petrograd. This handsome tree has large, dark purple fruit unlike in color that of any American species. Its native country is still unknown, but it has been suggested that it might have come originally from Persia or central Asia. Several trees of *C. peregrina* are now in full bloom in the Arboretum. Several other species of this Group are now covered with flowers. Large trees of *C. arnoldiana*, *C. arkansana* and *C. submollis* deserve attention. The first was discovered many years ago growing wild in the Arboretum, and although now commonly cultivated is known as a wild plant only in a few isolated stations. The large scarlet fruit, which ripens at the end of August or early in September, makes this the handsomest of the Thorns in late summer. *C. submollis* is another species which was first noticed growing in the neighborhood of the Arboretum but is now known to grow in Maine and the Province of Quebec. The pear-shaped fruit ripens four or five weeks later than that of *C. arnoldiana*. The scarlet fruit of *C. arkansana* is still brilliant on the branches in November. There are many other species of the Mollis Group now in flower, and different Hawthorns will be opening their flower-buds here during the next five or six weeks.

The Arboretum is a good place in which to study Hawthorns. Most of the Old World species and varieties are established, and some three hundred and fifty American species now flower and ripen their fruit here every year. For those parts of the country in which the soil is impregnated with lime and the winter climate severe, no other genus can furnish such a variety of trees and shrubs with handsome and conspicuous flowers and fruit.